

# PATENT SPECIFICATION

606,658



Convention Date (Switzerland): Dec. 20, 1943.

Application Date (in United Kingdom): Jan. 23, 1945. No. 1824/45.

Complete Specification Accepted: Aug. 18, 1948.

PUBLISHED BY :-  
THE PATENT OFFICE,  
25, SOUTHAMPTON BUILDINGS  
LONDON, W.C.2.

Index at acceptance:—Class 99(i). G1.

## COMPLETE SPECIFICATION.

### Fitting for Connecting Pipes by Welding.

We, AKTIENGESELLSCHAFT BROWN BOVERI & CIE., of Baden, Switzerland, a Swiss Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Up to the present standard steel pipes particularly gas pipes, have been joined together by means of screwed fittings the shape of which is made to suit the pipes in question. Since there are, however, not only straight, angular, bent, tee and cross fittings as well as elbow and branched pieces for pipes of the same diameter, but also connecting pieces for all sorts of possible combinations of diameters, the number of such fittings amounts to thousands. Each fitting requires its own casting or pressing mould so that these fittings are not cheap even when mass-produced.

Of late the pipe ends are frequently connected together by welding, at least in such installations where the pipes are not likely to have to be disconnected. Where the pipes are joined together in a straight line and have the same diameter this form of connection can easily be made. When, however, the pipes have different diameters or change their direction, and in the case of branch pipes, it is expedient or even necessary to insert intermediate pieces, so-called "weld fittings".

In order to be able to make as many welded connections as is the case when using screwed fittings, the same number of patterns for weld fittings would have to be made as there are screwed fittings.

This is avoided according to the present invention and the number of patterns required for weld fittings is reduced to a small fraction of that required for screwed fittings.

The invention consists in a universal pipe fitting for connection by welding between pipe ends of the same or different diameters, characterised by the feature that the fitting consists of a

plurality of branches for connection to said pipe ends, each branch comprising an integral extension nipple of substantially tapering form that for the purpose of being welded to a pipe end is cut off at a point where the diameter of the remaining end corresponds to that of the pipe end to be connected.

A number of constructional examples of the invention are illustrated in the accompanying drawing where Figure 1 shows in elevation a pipe bend or elbow; Figure 2 a return bend; Figure 3 a rectangular cross-piece; Figure 4 a branched piece; and Figures 5 and 6 show two alternative forms of the wall of the fitting in longitudinal section.

At the points where the extension nipples of the fittings are welded to the pipes it is advisable to provide rounded grooves *a* when the fitting is conical as shown in Figure 5, or steps *b* whose concave corner is rounded as in Figure 6. Grooves having other shapes can also be used. Each groove or step corresponds to the diameter of a standard pipe as is for instance indicated on the fittings shown in Figures 2 and 3.

If for instance a pipe with an internal diameter of  $\frac{3}{4}$ " has to be connected, then the extension nipple is cut off at the groove or step marked  $\frac{3}{4}$ " so that the pipe to be welded exactly matches the fitting. This is indicated for the right-hand extension nipple of the cross-piece shown in Figure 3.

How big the series of different pipe diameters has to be made must be determined by accurate calculations, so that on the one hand the fittings do not become too numerous or heavy, or that too much material is wasted when the extension nipples are cut off, and on the other hand due consideration must be paid to the fact that it is not desirable that too many different kinds of fittings should have to be kept in stock. It is also conceivable that fittings can be kept in stock with extension nipples for only a few pipe diameters, for instance three, in addition

[Price ~~Price~~ 3s. 6d.

~~PRICE~~ ~~Price~~ 3s. 6d.

Price 4s 6d

Price 3s 6d

to fittings for a larger number of pipe diameters, for instance ten. It is also possible to produce fittings with a coarser graduation of pipe diameters where various steps, for instance every second step is omitted, or where the graduation is not in accordance with a single cone but with several cones of different pitch, or according to a curve.

10 The wall thickness of the conical or stepped pipe connection can either be constant or decrease towards the end, to suit the thickness of the pipe to be joined.

15 The conical form of fitting shown in Figures 1-5 also enables pipes with abnormal diameters to be welded; in such a case the extension nipple is cut off at the desired point between two adjoining grooves. If desired the grooves or steps can be entirely dispensed with.

The conical or stepped extension nipples can also be welded to other pipe elements such as flanges, tube nipples, connecting nipples for union nuts, valve casings, etc. Weld fittings can also be manufactured where one or more of the severable sections of the extension nipple are missing or where there is only one severable section.

In special cases it can be an advantage to make the fitting so that one opening of the connection member is located eccentrically with regard to the other opening. For instance this can be achieved by making a straight line along the surface of the connecting member lie perpendicular to the plane in which the opening of the nipple lies. The fitting can be made of weldable cast metal, or be forged or pressed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A universal pipe fitting for connection by welding between pipe ends of the same or different diameters, characterised by the feature that the fitting consists of a plurality of branches for connection to said pipe ends, each branch comprising an integral extension nipple of substantially tapering form that for the purpose of being welded to a pipe end is cut off at a point where the diameter of the remaining end corresponds to that of the pipe end to be connected.

2. Fitting as in Claim 1, characterised by the feature that the extension nipple is provided with annular grooves located

parallel to each other, said grooves being associated with a series of standard pipe diameters.

3. Fitting as in Claim 2, characterised by the feature that the base of the groove is rounded.

4. Fitting as in Claim 1, characterised by the feature that the extension nipple is provided with circular steps located parallel to each other and associated with a series of standard pipe diameters.

5. Fitting as in Claim 4, characterised by the feature that the concave corners of the steps are made round.

6. Fitting as in Claim 1, characterised by the feature that the extension nipples have walls of constant thickness.

7. Fitting as in Claim 1, characterised by the feature that the extension nipples have a wall thickness which decreases towards the tapered end.

8. Fitting as in Claim 1, characterised by the feature that at least one extension nipple is conical.

9. Fitting as in Claim 1, characterised by the feature that at least one extension nipple consists of several cones of different pitch arranged in series.

10. Fitting as in Claim 1, characterised by one feature that at least one extension nipple is a body of rotation with curved generator.

13. Fitting as in Claim 1, characterised by the feature that the fitting is made of a weldable cast metal.

14. Fitting as in Claim 1, characterised by the feature that the fitting is forged.

15. Fitting as in Claim 1, characterised by the feature that the fitting is pressed.

16. Fitting as in Claim 1, characterised by the feature that one opening of at least one extension nipple lies eccentrically with regard to the other opening.

17. Fitting as in Claim 16, characterised by the feature that a straight line along the surface of the pipe connection lies perpendicular to the plane in which the extension nipples join the fitting opening.

18. Fitting for pipes which are to be connected together by welding substantially as herein described, with reference to the accompanying drawings.

Dated this 23rd day of January, 1945.

MARKS & CLERK

of

London, Birmingham, Manchester and Glasgow.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig.1.

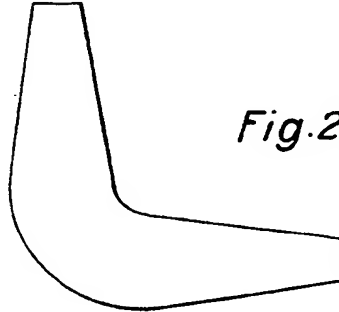


Fig.2.

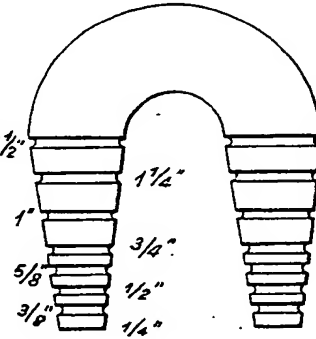


Fig.3.

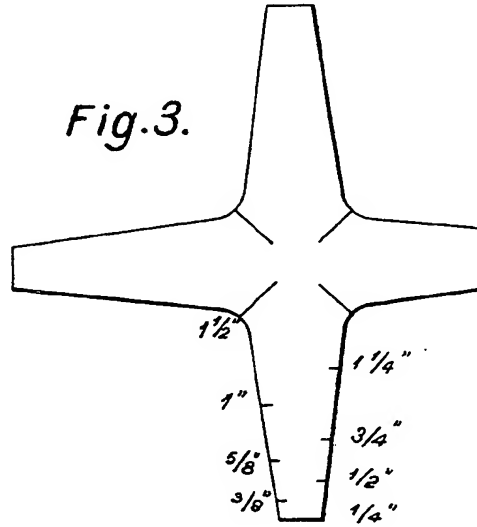


Fig.5.

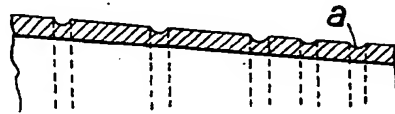


Fig.4.

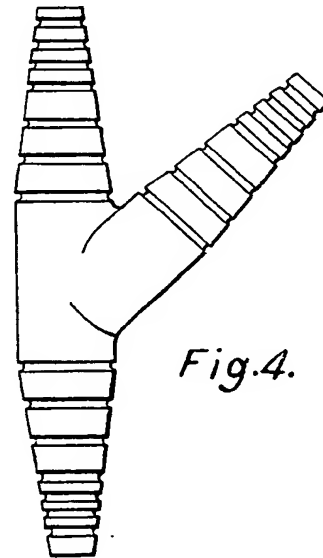
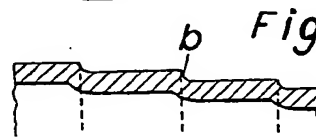


Fig.6.



PUBLISHED BY :-  
THE PATENT OFFICE,  
25, SOUTHAMPTON BUILDINGS,  
LONDON, W.C.2.

H.M.S.O. (Ty.P.)

**This page blank (uspio)**